IN THE CLAIMS:

The status and content of each claim follows:

1. (original) A method for generating a selectable perspective view of a portion of a hemispherical image scene, comprising the steps of:

acquiring an omnidirectional image on an image plane using a reflective mirror that satisfies a single viewpoint constraint and an image sensor;

defining a perspective viewing window based on configuration parameters;

defining a predetermined geometric relationship between the reflective mirror and the image plane; and

mapping each pixel in the perspective window with a corresponding pixel value in the omnidirectional image on the image plane using the configuration parameters.

2. (original) The method of claim 1, wherein the configuration parameters defined in the defining step include at least one of a zoom distance defined as the distance from the focal point of said reflective mirror to said window, a pan angle defined as the angle between the x axis and a line through the focal point of said reflective mirror perpendicular to the x-y plane and a tilt angle defined as the angle between the x-y plane and a vector normal to said window.

3. (original) The method of claim 2, wherein the defining step is conducted via a user interface through which a user enters data corresponding to at least one of a desired zoom distance, pan angle, or tilt angle.

4. (original) The method of claim 1, wherein the mapping step includes the step of generating a mapping matrix by:

applying a ray tracing algorithm to each pixel in the perspective viewing window to determine a corresponding reflection point on the reflective mirror; and

projecting each reflection point to a focal point of the image sensor to determine the corresponding location in the omnidirectional image on the image plane.

5. (original) The method of claim 4, further comprising the step of storing the mapping matrix in a module having a memory.

6. (original) The method of claim 1 wherein the step of defining a perspective viewing window defines the perspective viewing window as a panoramic viewing window.

7. (original) The method of claim 1, further comprising the steps of:

calculating a residual image based on a difference between a reference omnidirectional image and a sequential omnidirectional image;

determining if the residual image contains any value that exceeds a predetermined threshold; and

classifying any value that exceeds the predetermined threshold as an anomaly.

8. (original) The method of claim 7, further comprising the steps of:

calculating the configuration parameters for the perspective viewing window from the anomaly; and

selectively focusing the perspective viewing window on the anomaly using the calculated configuration parameters.

9. (original) The method of claim 7, further comprising the step of activating an alarm if at least a portion of the residual image exceeds a predetermined threshold.

10. (original) The method of claim 1, further comprising the steps of:

detecting a location of a sound source in the image scene; and

adjusting the perspective viewing window based on the detected location of the sound source.

11. (original) The method of claim 1, further comprising the step of transmitting the omnidirectional image via the Internet.

12. (original) The method of claim 11, wherein the transmitting step is conducted through a server that receives the omnidirectional image and transmits the omnidirectional image to at least one client.

13. (original) The method of claim 1, further comprising the step of forming a two-way transmission link between the image sensor and a remote display, wherein the two-way transmission link transmits at least one of the omnidirectional image, the perspective viewing window, and an audio signal.

14. (original) An improved imaging apparatus for generating a two-dimensional image, comprising:

a reflective mirror configured to satisfy an optical single viewpoint constraint for reflecting an image scene;

an image sensor responsive to said reflective mirror and that generates two dimensional image data signals to obtain an omnidirectional image on an image plane; and

a controller coupled to the image sensor, wherein the controller defines a perspective viewing window and includes a mapping matrix generator that defines a geometric relationship between the image plane and the perspective viewing window such that at least a portion of the omnidirectional image on the image plane can be mapped to the perspective viewing window.

15. (cancelled).

16. (original) The improved imaging apparatus of claim 14, wherein the reflective mirror creates a one-to-one correspondence between pixels in the omnidirectional image and pixels in the perspective viewing window.

17. (original) The improved imaging apparatus of claim 14, wherein the controller maps the omnidirectional image to the perspective viewing window by mapping each pixel in the perspective viewing window with a corresponding pixel value in the omnidirectional image.

18. (original) The improved imaging apparatus of claim 14, wherein the parameters defining the perspective viewing window include at least one of a zoom distance defined as the distance from the focal point of said reflective mirror to said window, a pan angle defined as the angle between the x axis and a line through the focal point of said reflective mirror perpendicular to the x-y plane and a tilt angle defined as the angle between the x-y plane and a vector normal to the perspective viewing window.

19. (original) The improved imaging apparatus of claim 18, further comprising a user interface through which a user enters data corresponding to at least one of a desired zoom distance, pan angle, or tilt angle.

20. (previously presented) The improved imaging apparatus of claim 14, wherein the controller generates a mapping matrix by applying a ray tracing algorithm to each pixel in the perspective viewing window to determine a corresponding reflection point on the reflective mirror and then projecting each reflection point to a focal point of the image sensor to determine the corresponding location on the omnidirectional image.

21. (original) The improved imaging apparatus of claim 14, wherein the perspective viewing window is a panoramic viewing window.

22. (previously presented) The improved imaging apparatus of claim 14, further comprising a module having a memory for storing a mapping matrix.

23. (original) The improved imaging apparatus of claim 22, wherein the module is a display/memory/local control module.

24. (original) The improved imaging apparatus of claim 14, wherein the controller calculates a residual image based on a difference between a reference omnidirectional image and a sequential omnidirectional image to detect an anomaly and uses the anomaly to calculate parameters for the perspective viewing window so that the perspective viewing window focuses on the anomaly.

25. (original) The improved imaging apparatus of claim 24, further comprising an alarm that is activated if at least a portion of the residual image exceeds a predetermined threshold.

26. (original) The improved imaging apparatus of claim 14, further comprising an acoustic sensor coupled to the controller for detecting a sound source within the image scene, wherein the controller adjusts the perspective viewing window based on a location of the sound source.

27. (original) The improved imaging apparatus of claim 14, further comprising an image transmission system for transmitting the omnidirectional image via the Internet.

28. (original) The improved imaging apparatus of claim 27, wherein the image transmission device includes a server that receives the omnidirectional image and transmits the omnidirectional image to at least one client.

29. (previously presented)The improved imaging apparatus of claim 14, further comprising:

a remote display coupled to the image sensor;

a first speaker and first microphone coupled to the image sensor; and

a second speaker and second microphone coupled to the remote display, wherein the first and second speakers and first and second microphones form a two-way transmission link between the image sensor and the remote display.

30. (previously presented)The improved imaging apparatus of claim 14, wherein said reflective mirror is a hyperbolic mirror having a hyperbolic cross-section.

31. (previously presented)An imaging apparatus for generating a two-dimensional image, comprising:

a reflective hyperbolic mirror having a hyperbolic cross-section;

an image sensor optically coupled to said reflective mirror that generates two-dimensional image data signals based on an omnidirectional image reflected by said mirror; and

a controller coupled to the image sensor, wherein the controller defines a perspective viewing window and includes a mapping matrix generator that defines a geometric relationship between the image sensor and the perspective viewing window such that at least a portion of the omnidirectional image on the image plane can be mapped to the perspective viewing window.

32. (previously presented)The imaging apparatus of claim 31, wherein the reflective mirror creates a one-to-one correspondence between pixels in the omnidirectional image and pixels in the perspective viewing window.

33. (previously presented)The imaging apparatus of claim 31, wherein the controller maps the omnidirectional image to the perspective viewing window by mapping each pixel in the perspective viewing window with a corresponding pixel value in the omnidirectional image.

34. (previously presented)The imaging apparatus of claim 14, wherein parameters defining the perspective viewing window include at least one of a zoom distance defined as the distance from the focal point of said reflective mirror to said window, a pan angle defined as the angle between the x axis and a line through the focal point of said reflective mirror perpendicular to the x-y plane and a tilt angle defined as the angle between the x-y plane and a vector normal to the perspective viewing window.

35. (previously presented)The imaging apparatus of claim 34, further comprising a user interface through which a user enters data corresponding to at least one of a desired zoom distance, pan angle, or tilt angle.

36. (previously presented)The imaging apparatus of claim 31, wherein the controller generates a mapping matrix by applying a ray tracing algorithm to each pixel in the perspective viewing window to determine a corresponding reflection point on the reflective mirror and then projecting each reflection point to a focal point of the image sensor to determine the corresponding location on the omnidirectional image.

37. (previously presented)The imaging apparatus of claim 31, wherein the perspective viewing window is a panoramic viewing window.

38. (previously presented)The imaging apparatus of claim 31, further comprising a memory for storing a mapping matrix generated by said mapping matrix generator.

39. (previously presented)The imaging apparatus of claim 31, wherein the controller calculates a residual image based on a difference between a reference omnidirectional image and a sequential omnidirectional image to detect an anomaly and uses the anomaly to calculate parameters for the perspective viewing window so that the perspective viewing window focuses on the anomaly.

40. (previously presented)The imaging apparatus of claim 39, further comprising an alarm that is activated if at least a portion of the residual image exceeds a predetermined threshold.

41. (previously presented)The imaging apparatus of claim 31, further comprising an acoustic sensor coupled to the controller for detecting a sound source within a scene of said omnidirectional image reflected by said mirror, wherein the controller adjusts the perspective viewing window based on a location of the sound source.

42. (previously presented) The imaging apparatus of claim 31, further comprising an image transmission system for transmitting image output by said image sensor via the Internet.

43. (previously presented) The imaging apparatus of claim 31, further comprising:

a remote display coupled to the image sensor;

a first speaker and first microphone coupled to the image sensor; and

a second speaker and second microphone coupled to the remote display,

wherein the first and second speakers and first and second microphones form a two-way transmission link between the image sensor and the remote display.

44. (previously presented) A method for imaging comprising the steps of:

reflecting an image onto an image sensor using a reflective hyperbolic mirror;

defining a perspective viewing window comprising at least a portion of said image reflected by said mirror;

defining a predetermined geometric relationship between the reflective mirror and the image sensor; and

mapping each pixel in the perspective viewing window with a corresponding pixel value output by the image sensor to reduce distortion.